SECTION 14

SURFACE PREPARATION AND PAINTING

14.1 REFERENCES

(14A) STEEL STRUCTURES PAINTING COUNCIL (SSPC), **Volumes I** and **II**

14.2 INTRODUCTION

This Section contains the Contractor Design and Provide general requirements for the coating systems to be used, the surface preparation required, and other Work to be accomplished with respect to coating and surface protection.

Paints and other coating systems shall be INTERNATIONAL Marine & Protective Coatings Co., or equal, except where other manufacturers' coatings systems are prescribed for specific applications. This Section of the Technical Specification has generally been written specifying INTERNATIONAL Marine & Protective Coatings Co. products. The coatings shall match the standardized existing INTERNATIONAL Marine & Protective Coatings paints, tint numbers, and systems used by WSF throughout the fleet, as to tint color, (i.e. "WSF ICE BLUE" leaning toward a "robin egg blue" color **shall not** be acceptable).

For WSF Fleet-wide Standardization purposes, End No. 1 of the Vessel shall always be considered the bow, and this designation shall delineate port and starboard, fore and aft wherever they are addressed in the Technical Specification.

14.3 GENERAL

In accomplishing the Work required by these Technical Specifications, the Contractor shall at all times comply with all local, State, and Federal laws and regulations concerning the protection of the environment, paying particular attention to the processes and precautions involved with the pressure washing, grit blasting, ultra high pressure water blasting and coatings portions of the Work. Due to problems that have arisen in the past, all prospective bidders are advised and encouraged to have their plans for accomplishing this Work reviewed by the Regional Director of Ecology for the geographical area where the Contractor's work facility is located, prior to submitting bids for this Work. In the State of Washington, the Regional Directors may be contacted at (360) 407-6121.

Color for topcoats of interior surfaces not specified herein shall be in accordance with the color scheme described in Section 25 of the Technical Specification.

At Vessel delivery to WSF, the paint on all surfaces of the Vessel exposed to view shall be clean and continuous with a freshly painted appearance.

The Contractor is responsible to **provide proper preparation and coating of <u>all</u> surfaces of the <u>entire</u> Vessel**, and as set forth in the Technical Specification.

NOTE: See final dry-docking requirements as required in the *DRY-DOCKING* Subsection in Section 1 of the Technical Specification, just prior to Dock Trials, for grit blast of entire hull and complete bottom paint system as set forth in the *COATING SYSTEMS* Subsection in this Section of the Technical Specification.

Where the words “coating” and “painting” are used in this Section and other Sections of the Technical Specification, they shall be considered synonymous.

The Contractor shall provide and apply all coatings and coating materials. Coatings and coating materials are to be of the best commercial marine grade, in full compliance with this Technical Specification Section, and shall not contain lead or lead-containing compounds.

The Contractor shall carefully mask and protect machinery, nameplates (including valve and equipment data plates), cable tags, identification labels, valve stems, fire hoses, bright work, glass, trim, and other similar items, devices, and materials which could be damaged by grit blasting, if performed, dust associated with the process, or other surface preparation techniques, or which could have their function and appearance degraded by paint over spray. Clean affected spaces and surfaces free of grit materials and residue immediately after grit blasting, if performed, and immediately and carefully remove any paint over spray applied to any of the aforementioned. Such cleaning and removal shall be wholly at the Contractor's expense.

Special care shall be taken to avoid contamination of adjoining spaces, machinery, and equipment. Machinery and equipment which cannot be adequately protected by masking shall be removed, properly stored, reinstalled after completion of painting, and tested to demonstrate satisfactory performance at the Contractor's expense. Any material and/or item damaged and/or contaminated by the Contractor shall be promptly repaired, replaced, or cleaned to original condition at the Contractor's expense.

Once the Vessel is waterborne, at a minimum, any areas requiring coating system application below the waterline shall be provided with, and include the use of, heated dehumidifier (DH) units supplying heated dry air to the area to assist coating system curing.

Dry Film Thickness (DFT), where specified, is the minimum DFT in mils over the top of surface anchor profile peaks. Where both film thickness, and number of coats are specified, both requirements shall be fully met. The Contractor shall measure and record the "effective magnetic surface" of freshly grit blasted surfaces in accordance with SSPC-PA 2 of Steel Structures Painting Council (SSPC), and shall record that data as part of all inspection sign-off documentation. After demonstration of consistency of approved mil readings of freshly grit blasted surfaces, the WSF Representative may deem further readings as unnecessary. Sample readings may be requested at any time, to the satisfaction of the WSF Representative.

The Contractor shall provide new spray tips for all spray equipment at the beginning of the project. New spray tips shall be provided during the life of the project as required by the coating systems representative.

Instruments used to measure DFT shall have been recently calibrated in accordance with SSPC-PA 2 of Steel Structures Painting Council (SSPC) for the substratum involved and shall be routinely re-calibrated while the Work is being performed and at any other time if specifically requested to do so by the WSF Representative. Calibration and re-calibration shall be at the Contractor's expense.

Coating systems shall be stored, mixed, and applied in strict accordance with that manufacturer's current published recommendations and utilizing the latest production information data sheets, preparation, and application guides available through the manufacturer's authorized field service representative.

Requirements for painting aluminum surfaces are specified herein. Other nonferrous metals and galvanized surfaces, if they are to be painted, shall first be thoroughly cleaned with solvent and then etched and flushed, or lightly sand swept as recommended by the coating manufacturer.

The back sides of angles, edges of structural shapes, and areas that are incapable of being properly covered by using conventional or airless spray equipment shall be hand-brushed to insure that the minimum dry film thickness is obtained.

The Contractor shall prepare and recoat any and all areas of new painted Work on the Vessel, which have been damaged or disturbed by any Work required by the Technical Specification or otherwise caused by actions of the Contractor or subcontractors, to match the original undamaged surface in accordance with the preparation and painting requirements of this Section of the Technical Specification.

Prior to application of any coatings, ensure that all surfaces are dry and free of foreign matter. Particular attention shall be paid to the temperature and humidity conditions at the time of application. Should the Contractor choose to paint hull structures or attachments which may be affected by condensation caused by the Vessel being waterborne, he shall exercise extraordinary care to ensure that surfaces to be painted are thoroughly dry, and the space is heated and dehumidified to levels in keeping with the paint manufacturer's current published preparation and application guidelines. This extraordinary care shall be at the Contractor's expense. Coatings shall only be applied at ambient and surface temperatures above the current published manufacturer's recommendation, and only be applied when the temperature of the surface to be coated is at least 5F degrees above the dew point temperature, and rising. Environmental condition data results, spoken to above, shall be recorded on all inspection sign-off documentation.

Welds and piping system joints or connections requiring pressure testing or visual inspection shall not be coated until after all tests and inspections are complete and the weld, piping joint, or connection has been accepted by the cognizant inspector(s).

Prior to the application of any follow-on coat, thoroughly clean and build up any bare or lightly covered spots in the previous coat to the required thickness. Where any coating has

been damaged by welding, burning, or other causes, repair the damaged area as set forth in the *SURFACE PREPARATION* Subsection in this Section of the Technical Specification, ensuring that edges are feathered and that no sanding swirls or other marks will remain after the final coat is applied. Prepare the cleaned surface in accordance with the manufacturer's current published requirements and apply a full coating system. Keep surfaces clean and moisture free during the coating process and during the curing period.

Equipment, which is delivered to the Shipyard in the primed condition, shall receive two (2) coats of finish enamel. Equipment that is delivered to the Shipyard complete with finished coatings shall be protected from damage during the construction, and shall be repaired, recoated, and/or touched up, as necessary, upon completion of Work. Colors shall be as specified by WSF.

Solvents used for thinning and cleaning shall be in strict accordance with the coating manufacturer's current published recommendations, and shall be handled, stored, and disposed of in strict accordance with the manufacturer and all current laws, rules, or regulations, whether local, State, or Federal, pertaining to toxic and/or hazardous waste.

The Contractor shall present to WSF for inspection the major milestones (hold-points) of the surface preparation, equipment set up and condition, and paint and/or coating process for each section or area to be coated. Inspection Hold-Points shall include, but not be limited to:

1. Surface preparation prior to grit blasting (weld splatter, sharp corners, and rough welds: ground smooth; temporary foundations brackets and/or hangers: removed and ground flush).

2. Masking and protective coverings completed and ready for grit blast.

3. Blast equipment set up and condition (nozzle size, type of grit, CFM at nozzle, air compressor blotter test).

4. Environmental conditions prior to and during grit blast (dew point, surface temperature).

5. pH neutral surface, anchor profile and "effective magnetic surface" after grit blast or surface appearance after specified SSPC preparation.

6. Painting and/or coating equipment set up and condition (nozzle size, CFM at equipment, air compressor blotter test).

7. Environmental conditions prior to and during painting and/or coating (dew point, surface temperature, air quality).

8. Dry film thickness (DFT) and appearance of each coat.

NOTE: Some coating systems, when applied with a roller, have a tendency to bubble. This condition is **unacceptable** and will require correction at the Contractor's expense.

Equipment and/or instruments used by WSF to assist in evaluating preparation, conditions, and/or finished product during inspections shall include, but not be limited to: Psychrometers, Surface Thermometers, Hypodermic Needle Gauge, Blast Nozzle Aperture Gauge, Replica Tape, pH Paper, Surface Profile Standards, NIST (NBS) Calibration Standards, Dry Film Thickness (non-destructive) Type 1 and Type 2 Gauges, Holiday Detector (low voltage), and Ultraviolet Hand Lamp (long wave model for fluorescence of surface oils).

Inspections shall be performed as set forth in this Section and Section 1 of the Technical Specification.

It is the Contractor's sole responsibility to ensure all required inspections are completed, and accepted in writing before continuing Work. Proceeding without the required inspections shall be at the Contractor's risk.

14.4 AREAS TO BE COATED

The Contractor shall prepare the surface of, and coat, as defined in this Section and Sections 85, 87, and 89 of the Technical Specification, all wood, steel, stainless steel, and aluminum plates, sheet, shapes, piping, trim, equipments and ductwork on both the interior and exterior of the **entire Vessel** unless specifically exempted elsewhere in this Technical Specification or by direction of the WSF Representative. **The intent of WSF is for the Contractor to coat the Vessel, inside and out, in its entirety**.

Preparation and coating shall include, but not be limited to: those items addressed above, coamings, brackets, foundations, ladders (vertical and inclined), wireways, stand-offs, kick tubes, multi-cable transits, multi-cable penetrations, cables (except armored), vestibules, scuppers, tanks (interior and exterior), engine exhaust, deck gratings, supports, intakes, exhausts, grilles, louvers, railings, gates, name boards, shelving, shafting, stairways, lockers, insulation, gauge boards, life jacket lockers, galvanized sheet metal trim and sheathing, line shaft bearing assemblies, propulsion motors and bearings, stanchions benches, seats, and platforms.

Priming or painting of concealed galvanized ductwork and pipe **is not** required.

All stainless steel shall be left uncoated unless otherwise directed by the Technical Specification, or the WSF Representative. The stainless steel louvers assemblies, and the four (4) Vehicle Deck overhead life jacket lockers shall receive full coating systems inside and outside to match the surrounding area.

14.5 SURFACE PREPARATION

14.5.1 General

All new steel shall be wheelabrated and coated with an approved zinc based primer prior to fabrication as specified in the *PAINT SCHEDULE* Subsection, Pre-Construction Primer of this Technical Specification. Care shall be exercised to ensure that primers are compatible with the coatings systems specified.

Unless approved otherwise, in writing, by the WSF Representative, any steel surfaces disturbed after installation, shall be grit blasted to an SSPC-SP 10 "*Near-White Blast Cleaning*" of Steel Structures Painting Council (SSPC) in **all** exterior areas, and an SSPC-SP 11 "*Power Tool Cleaning to Bare Metal*", of Steel Structures Painting Council (SSPC) in all interior areas, and re-primed prior to painting.

The WSF Representative will consider the use of an approved ultra high-pressure water blasting system with pressures of 36,000 psi, or greater, in lieu of grit blasting. Such an ultra-high pressure water blasting system must achieve equal to or greater surface preparation (to include required anchor profile) than is required by this Technical Specification Section and shall meet all appropriate SSPC Specifications (SSPC-UHP-WJ4 "*Ultra-High Pressure Standard*"). The Contractor shall request approval in writing from the WSF Representative for any use of any ultra high-pressure water blasting system.

In all cases, unless approved otherwise by the WSF Representative, those surfaces specified to receive non-skid coating systems shall have their base areas prepared by grit blasting to an SSPC-SP 10 "*Near-White Blast Cleaning*" of Steel Structures Painting Council (SSPC) prior to the application of the coating system as set forth in **TABLE 14-2** at the end of this Section and the *COATING SYSTEMS* Subsection below.

All surface preparation specified to be "*Power Tool Cleaning to Bare Metal*" shall be as defined by SSPC-SP 11 of Steel Structures Painting Council (SSPC).

All surface preparation specified to be "*Near-White Blast Cleaning*" shall be to an SSPC-SP 10 of Steel Structures Painting Council (SSPC).

Surface preparation specified to be "*Brush-Off Blast Cleaning*" shall be to an SSPC-SP 7 of Steel Structures Painting Council (SSPC).

Surface preparation specified to be "*Commercial Blast Cleaning*" shall be to an SSPC-SP 6 of Steel Structures Painting Council (SSPC).

Surface preparation specified "*Power Tool Cleaning*" shall be to an SSPC-SP 3 of Steel Structures Painting Council (SSPC).

Surface preparation specified "*Solvent Cleaning*" shall be to an SSPC-SP 1 of Steel Structures Painting Council (SSPC).

Grit blasted and ultra high-pressure water blasted surfaces shall have an anchor profile depth of 1½ to 2½ mils, unless otherwise specified by the manufacturer and WSF. The Contractor is reminded that over blasting to an anchor profile greater than the 1½ to 2½ mils noted above, shall require additional quantities of coating materials to cover. Any such additional materials shall be at the Contractor's sole expense.

Visual Standard SSPC-VIS-1-89 forms a part of this Contract and will be used, along with anchor profile replica tape such as TESTEX Inc., and Ultraviolet Hand Lamp (long wave model for fluorescence of surface oils) to assist in judging the adequacy of the surface preparation.

Paint Application Specification SSPC-PA 2 of Steel Structures Painting Council (SSPC) forms part of this Contract and will be used in the measurement of dry paint thickness with type 1, pull-off gauges and type 2, fixed probe gauges.

NOTE: No new equipment or machinery shall be installed until grit blasting, grit cleanup, and paint priming has been 100-percent (100%) completed unless approved, in writing, by the WSF Representative.

Take necessary precautions to ensure that grit blasting does not damage propeller shafts, bearings, and propellers.

Prior to grit blasting, clean area to be grit blasted, to an SSPC-SP 1 "*Solvent Cleaning*" of Steel Structures Painting Council (SSPC) and Contract requirements. Remove all sharp edges, burrs, weld splatter, etc., so that no rough spots exist which can penetrate the coating film. To eliminate sharp edges, ***edges shall have a minimum radius of 3mm***.

Immediately after grit blasting or mechanical surface preparation of new steel, remove all surface contaminates, obtain concurrence from the WSF Representative, and apply the applicable primer in accordance with **TABLE 14-2** to prevent rust bloom. Under no circumstances leave freshly blasted or mechanically prepared steel overnight without primer. Should freshly blasted or mechanically prepared new steel be left unprimed, the Contractor shall re-blast or mechanically re-prepare to the originally specified quality, removing all traces of rust bloom. All rework shall be wholly at the expense of the Contractor.

Application of primer coats later the same day of blasting will only be allowed in an area where the Contractor has exercised humidity control sufficient to prevent the occurrence of any rust bloom and after the inspection and approval of that area by WSF just prior to coating.

NOTE: It is incumbent upon the Contractor to provide the WSF Representative with timely notification in order to preclude delays in required inspections. Failure to obtain the WSF Representative's approval, where required, may require re-preparation and coating wholly at the expense of the Contractor.

Those areas requiring grit blasting which have borders and other areas which cannot practically be grit blasted shall have those areas prepared to an SSPC-SP 11 "*Power Tool Cleaning to Bare Metal*" of Steel Structures Painting Council (SSPC). The use of an SSPC-SP 11 "*Power Tool Cleaning to Bare Metal*" preparation in these above mentioned areas shall be only after approval of the Contractor's request, in writing, by the WSF Representative. The substitution of an SSPC-SP 11 "*Power Tool Cleaning to Bare Metal*" preparation is at the sole discretion of the WSF Representative.

If the Contractor utilizes a "shot type" deck blaster it shall be of the "angular grit" type **only** to achieve an "angular" profile versus a "peened" profile. The Contractor shall assure that all errant grit is removed from the surfaces of the Vessel in a timely manner to prevent rust bloom caused by such errant angular grit. Any rust and/or damage caused by grit shall be removed and/or repaired at the Contractor's sole expense.

14.5.2 Special Instructions

If certain machinery and/or equipment **must** be installed in a space due to production necessity, and if approved by the WSF Representative; fit durable, 100-percent (100%) sealed protective covers, which completely enclose and protect the machinery and/or equipment during all phases of grit blasting, paint preparation, painting and/or clean-up work.

Vacuum removal equipment shall be frequently used to remove and prevent excessive residue build-up during grit blasting and/or coating preparation.

Fit the line shaft bearings with durable, 100-percent (100%) sealed protective covers prior to grit blasting anywhere on the Vessel, or prior to coating preparation and application with spray equipment in the local area.

NOTE: Protect the bilge suctions from entry of residue from grit blasting. The Contractor **shall not** use the Vessel's bilge system for removing waste liquids.

14.6 CAULKING SYSTEM

For WSF Fleet-wide Standardization purposes, the caulking system for exterior (weather) areas shall be AC PRODUCTS INC. Flexible Seal Sealant, "WHITE".

All seams exposed to the weather, including but not limited to: the inside of the Vehicle Deck Curtain Plate, Vehicle Deck and Ramp overheads, Machinery Casing exteriors, interior

of the Sun Deck Passenger Lounge, Passenger Deck embarkation areas vestibule overhead, Pilothouse visors, Pilothouse Bridge Wings shall be caulked to preclude moisture entrance and the resulting rust bleed. Caulking shall be applied to seal all seams resulting between skip welding operations such as beams to deck plate joints, overlapped joints, butt joints, open seams, etc. Caulking shall be applied prior to the final coat of paint.

14.7 COATING SYSTEMS

14.7.1 General

All coatings used shall comply with all regulations regarding volatile organic compounds (VOCs). The Contractor shall provide written evidence from the manufacturer demonstrating compliance with this requirement.

Unless otherwise specified, the coating system for the "exterior hull" shall be the products of INTERNATIONAL Marine & Protective Coatings Co., or equal. All other exterior and interior bulkheads, overheads, structure, decks, etc. unless otherwise specified, shall be the products of the INTERNATIONAL Marine & Protective Coatings Co., or equal. Interior decor top coats shall be those specified in the approved Contractor's design and manufactured by RODDA Porsalite, or equal. The exterior side of doors exposed to the weather shall be coated to match the bulkhead paint schedule. Doors located within the Machinery Casing shall have the exterior side coated "HAZE GRAY".

Coatings shall be applied to surfaces and in all spaces generally as listed below and in **TABLE 14-2**, Paint Schedule. It is not intended that **TABLE 14-2** cover every space or situation. Spaces not specifically mentioned shall be coated in like manner to a similar space listed in the Table.

TABLE 14-2 is based upon INTERNATIONAL Marine & Protective Coatings Co. coating systems, except where AMERON INTERNATIONAL products are specifically cited for WSF Fleet-wide Standardization purposes non-skid coatings. Alternative systems may be proposed which satisfy the "or equal" requirements specified in the *DEFINITIONS, ABBREVIATIONS AND INTERPRETATION OF TERMS* Article of **VOLUME III,** CONTRACT PROVISIONS, and that have demonstrated records of success of at least ten (10) years in similar environments. Any request for "or equal" (see Section 1 of the Technical Specification) substitution shall include an updated **TABLE 14-2** reflecting specific coatings applications proposed, and one (1) copy of the proposed coating system manufacturer's master catalog including all product data and MSDS sheets. All proposed coatings shall be readily available, within 24 hours, in the Pacific Northwest and demonstrated to match tint formulas as set forth in **TABLE 14-1** below. (The Contractor is advised that WSF currently has proven Vessel top and bottom experience only with INTERNATIONAL and AMERON coating systems).

TABLE 14-1 COLOR TINT STANDARD	
COLOR	**INTERNATIONAL TINT NUMBER**
WSF Ice Blue White	#72942
Haze Gray	#K705
WSF Green	#89904

ATTENTION: *Due to the inherent inability of certain colors to cover with a single coat, unless specifically called out differently elsewhere in the Technical Specification,* ***in all cases*** *where "SIGNAL YELLOW" or "ENSIGN RED" are specified as a topcoat, two (2) coats, at a minimum of 2 mils (DFT) each coat, and to cover shall be provided.*

Coatings shall be applied to surfaces in accordance with the current published recommendations and requirements of the manufacturer.

14.7.2 Faced Insulation

Apply sealing and finish coats to all fiberglass faced insulation exposed to view of Passengers and/or Crew throughout the Vessel as specified in **TABLE 14-2**.

14.7.3 Safety Marking

Paint the vehicle lane stripes and other safety stripes in accordance with this Section, and Section 24 of the Technical Specification, as specified in **TABLE 14-2**.

Vehicle lane stripes, lashing sockets and other safety stripes and striped safety warning markings shall be painted on the Lower Vehicle Deck (Main Deck), delineating clear access lanes adjacent to the Elevators. Zones of twelve (12) inch wide "BLACK" and using two (2) coats of "SIGNAL YELLOW" diagonal striping shall be marked-out where parking of vehicles will not be allowed in order to permit access and egress to the Elevators.

Apply the same "BLACK" and "SIGNAL YELLOW" safety warning markings on the Vehicle Decks delineating clear access lanes adjacent to the Machinery Casing cross passages, the Engine Room accesses, Evacuation Slide/Platform Stations in way of the Passenger Elevator ramps, thirty-six (36) inch wide ADA access paths from the elevators to the Ends of the Vessel, and at Emergency Squad Lockers. In addition, there shall be

marked out zones using two (2) coats of "SIGNAL YELLOW" paint where parking of vehicles will not be allowed in order to permit access to and egress from the Engine Rooms, Steering Gear Rooms and other Emergency Escape watertight deck hatches.

A Lower Vehicle Deck edge six (6) inch wide "WHITE" stripe shall be applied on the horizontal deck surface, from the end of the left bulwark to the end of the right bulwark, to mark the conclusion of each End (brow) to help delineate, for safety purposes, the End of the Vessel at night.

Personnel protection pads as set forth in the *PERSONNEL PROTECTION* Subsection in Section 1B of the Technical Specification shall be painted using two (2) coats of "SIGNAL YELLOW", at a minimum of 2 mils (DFT) each coat, to cover.

Paint all fire stations, spray applicators (except for nozzle), pull boxes, fire axes (heads) and their boxes, locked and break glass key boxes, fire extinguishers and their boxes, CO_2 cylinders, CO_2, and Hi-Fog® piping, the last four (4) lineal feet of Firemain piping and hose valves at all fire stations, fire hose racks and boxes, and other similar fire fighting equipment throughout the Vessel using two (2) coats of INTERNATIONAL Intercare 755 "ENSIGN RED", at a minimum of 2 mils (DFT) each coat, to cover.

Stencil all warnings and notices on the Vehicle Decks with INTERNATIONAL Intercare 755 colors as specified in Section 24 of the Technical Specification, and **TABLE 14-2**.

14.7.4 Galvanized Sheet Steel Lining

Remove all greases, oils, water, salt, or other similar surface contaminants from the galvanized sheet steel linings installed as specified by Section 7 of the Technical Specification using INTERNATIONAL GMA 571, or equal. Apply the coating systems specified in **TABLE 14-2**.

14.7.5 Tanks

All tank interior coating shall be provided with and include the use of heated dehumidifier (DH) units supplying heated dry air to the tank interiors to assist coating system curing.

14.7.5.1 Tank Interiors

Coating systems as described in **TABLE 14-2** shall be applied to the interior surfaces of the voids, cofferdams, potable water tanks, sewage tanks, and the oily water holding tank. The coatings shall be extended at least twelve (12) inches into the pipe connections of all tanks.

Excess coating shall be removed from all pipe connections. Small connections such as those used for tank level indicators, gage glasses, thermowells and other such openings shall be confirmed to be free and clear prior to closing the tank.

14.7.5.2 Potable and Fresh Water Flushing Tanks

The Contractor shall prepare interior surface areas of the potable and fresh water flushing tanks, to power tool cleaning to an SSPC-SP 10 "*Near-White Blast Cleaning*", in accordance with the guidance provided in the *SURFACE PREPARATION* Subsection in this Section of the Technical Specification. Upon approval of the surface preparation by WSF, the Contractor shall immediately coat the interior surfaces of the tanks in accordance with the coating requirements specified in **TABLE 14-2**.

14.7.5.3 Jacket Water, Used Oil and Oily Bilge Water Tanks

The Contractor shall prepare interior surface areas of the jacket water, used oil and oily bilge water tanks to an SSPC-SP 10 "*Near-White Blast Cleaning*" in accordance with the guidance provided in the *SURFACE PREPARATION* Subsection in this Section of the Technical Specification. Upon approval of the surface preparation by WSF, the Contractor shall immediately coat the interior surfaces of the tanks in accordance with the coating requirements specified in **TABLE 14-2**.

14.7.5.4 Petroleum Product Storage and Day Tanks

The Contractor shall grit blast the interior surfaces of all petroleum product storage and day tanks to an SSPC-SP 10 "*Near-White Blast Cleaning*" in accordance with the guidance provided in the *SURFACE PREPARATION* Subsection in this Section of the Technical Specification. Upon approval of the surface preparation by WSF, the Contractor shall immediately spray the interior surfaces of the tanks with warm, non-volatile preservation oil compound compatible with the products to be carrier in the tanks, and remove any excess oil using lint free rags. Seal the manhole and coat the exterior surfaces in accordance with the coating requirements specified in **TABLE 14-2**.

14.7.5.5 Sewage Holding Tanks

The Contractor shall prepare interior surface areas of the Sewage Holding Tanks to an SSPC-SP 10 "*Near-White Blast Cleaning*" in accordance with the guidance provided in the *SURFACE PREPARATION* Subsection in this Section of the Technical Specification. Upon approval of the surface preparation by WSF, the Contractor shall immediately coat the interior surfaces of the tanks in accordance with the coating requirements specified in **TABLE 14-2**.

Clean excess coating from all pipe connections and ensure that small connections like those used for tank level indicators, gauge glasses, thermowells and other such openings, are free and clear prior to closing all tanks.

14.7.6 Cathodic Protection

When applying coating systems on the hull in way of the impressed current cathodic hull protection anodes, as defined in Section 90 of the Technical Specification, ensure that none of the anodes or the reference cells are damaged or covered with paint. Apply special coatings around the anodes under the anti-fouling coating as required by the manufacturer of the impressed current system.

14.7.7 Exterior Hull

During the final dry-docking phase of the Contract (required just prior to Dock Trials) the entire exterior hull shall be grit blasted and receive its full coating system, except as noted below. This final dry-docking shall require Vessel "bumping" on the blocks to achieve a full coating system. Except as noted in the *Keel Cooler Areas Coating System* Subsection below, the entire hull shall be grit blasted at that time to an SSPC–SP 6, "*Commercial Blast Cleaning*" prior to application of a full bottom coating system from the top horizontal surface of the plate guard (rub rail) down to, and including, all interior surfaces of sea chests and the keel, in accordance with the requirements of **TABLE 14-2**. Up to this point of construction under the Contract, the Contractor shall coat bottom hull surfaces with an adequate system to hold the steel from corrosion until this final dry-docking. The Contractor shall pay particular attention to weld seams during grit blasting to remove all acids and contamination from the welding process, and produce the proper anchor profile.

NOTE: The Contractor shall stagger the different coating systems where the required Vessel "bumping" is achieved to produce a continuous coating system of each coating product.

14.7.7.1 Keel Cooler Areas Coating System

The areas under and surrounding the keel coolers have been, in the past, problematic on other WSF Fleet Vessels. For this reason, these areas shall be provided with additional AC coats. All areas within the keel cooler hull locations shall be prepared and coated with three (3) full coats of AC and two (2) full coats of AF prior to the coolers being installed. The keel cooler hull locations shall be grit blasted to an SSPC–SP 6, "*Commercial Blast Cleaning*", and receive the abovementioned full system during the construction period and prior to cooler installation, and the required full hull coating system Work required by the *Exterior Hull* Subsection above. These keel coolers and areas shall be protected and not be re-grit blasted during the final dry-docking. The intent is that these keel cooler areas will have their

required full system applied and approved **prior** to the Vessel being originally launched.

14.7.7.2 Hull Markings

After the full bottom coating system, provide all draft makings and underwater hull locator markings in general accordance with the requirements and WSF Fleet-wide Standardization purposes methodology of WSF Drawing 8305-645-001-01 for M/V CHELAN and **TABLE 14-2**.

14.7.7.3 Application of DuraFlake System to Rudder

For WSF Fleet-wide Standardization purposes, grit blast the bulbous propeller end of each rudder, top to bottom, to a SSPC–SP 5, "*White Metal Blast*", with an anchor profile of 4 to 6 mils (required for the DuraFlake applications), prior to application of Marine Grade CISERV CGL DuraFlake system. The coating shall be applied to a minimum of 30 mils DFT. Supervision of the DuraFlake installation shall be obtained from CORROSION SPECIALISTS INCORPORATED (contact Mr. Brad Bradshaw, phone (360) 568-2098).

Grind the entire surface of the DuraFlake smooth to prevent cavitation. No rough edges will be allowed.

NOTE: For bidding purposes, assume 60 square feet for each rudder for a total of 120 square feet each Vessel.

The application of the DuraFlake coating system shall be applied to the bare grit blasted steel in lieu of the anti-corrosion coatings, followed with the full below waterline anti-fouling (3rd and 4th coat) coating system required in the *Exterior Hull* Subsection above.

14.7.8 Hardwood

Interior and exterior exposed hardwood shall be well-smoothed and finished, for WSF Fleet-wide Standardization purposes, with three (3) coats of SIKKENS Cetol Marine exterior wood finish in strict accordance with the manufacturer's instructions.

14.7.9 Vessel Name Boards

The six (6) name boards defined in Section 24 of the Technical Specification shall be sanded smooth, sealed, and the lettering, arrow heads and tapered edges painted with INTERNATIONAL Intercare 755 "SIGNAL YELLOW" at a minimum of two (2) mils (DFT), to cover. For WSF Fleet-wide Standardization purposes, apply a finish of three (3) coats, three (3) mils each, of SIKKENS Cetol Marine exterior wood finish in strict accordance with the manufacturer's instructions.

Install the six (6) name boards, using stainless steel invisible fasteners, after all exterior superstructure painting has been completed. Vessel name boards shall be covered and protected from damage until just prior to Dock Trials.

14.7.10 Official Number

The Vessel's official number shall be installed as set forth in the *OFFICIAL NUMBER* Subsection in Section 24 of the Technical Specification.

14.7.11 Vehicle Decks (Weather Side)

The entire Vehicle Deck areas shall be grit blasted to an SSPC-SP 10 "*Near-White Blast Cleaning*" after fabrication and prior to application of the coating systems as set forth in **TABLE 14-1**, *PAINT SCHEDULE.*

14.7.12 Vehicle Deck Markings

Provide markings as set forth in this Section and the *VEHICLE SPACE AND SPACE MARKINGS* Subsection in Section 24 of the Technical Specification and **TABLE 14-2** of this Section.

14.7.13 Machinery, Equipment, Piping, and Ventilation Ducts

All items of machinery and equipment shall be delivered with the manufacturer's recommended coating. Items furnished with the prime and finish coats shall receive one (l) final touch up or repaint coat to disturbed surfaces as determined by the WSF Representative. All colors are to be in accordance with the manufacturer's recommendations and as directed by the WSF Representative.

All vent ducts, piping and the pipe covering exposed to view shall be coated in accordance with **TABLE 14-2**. Joints or other places as specified in Section 24 of the Technical Specification shall be stenciled or similarly labeled with the name of the service and direction of flow.

Concealed black steel piping shall be cleaned free of all scale, oil and grease and coated with two (2) primer coats of an approved quality marine primer on exterior surfaces.

Paints applied to piping, machinery and equipment, which operate at temperatures over 180F degrees shall be coated in accordance with **TABLE 14-2, Miscellaneous Applications**.

For painting of piping prior to testing and application of insulation, see Sections 75 and 101 of the Technical Specification, and **TABLE 14-2**.

14.7.14 Cementing

The inaccessible portions of the skegs, and portions of the bottom structure in way of the stern frame and rudder, shall be filled with concrete to ensure complete drainage and proper maintenance. The concrete mix shall include a lightweight aggregate of a weight density of not more than 100 pounds per cubic foot. Vibration tools shall be used to ensure the concrete settles into the most remote areas. Cut limber holes as needed for drainage. The concrete shall be sloped for drainage. All steel shall be properly prepared and coated in accordance with **TABLE 14-2** prior to placing concrete. Cement is to be installed after Builder's Trials as directed by the WSF Representative.

14.7.15 Vehicle Deck Curb, Ramps, and Curb Walkways

All steel shall be properly prepared and coated, on both sides, in accordance with **TABLE 14-2**. Filling of Vehicle Deck curbing and other voids with foam products **will not** be permitted.

14.7.16 Dissimilar Metals Isolation

Isolation between aluminum and steel shall be accomplished by coating faying surfaces with one (1) coat of Pretreatment Primer and one (1) coat Zinc Chromate Primer and one (1) layer of 3M Tape # 50, or equal.

Faying surfaces of aluminum furniture and dissimilar metals shall be protected by application of one (l) coat of Pretreatment Primer and one (l) coat Zinc Chromate Primer to both surfaces as a minimum prior to setting the furniture. Fasteners shall be of Type 316 stainless steel as required by Section 1 of the Technical Specification.

14.7.17 Steel Bar Type Ballast

Steel bar type ballast as set forth in the *STABILITY AND SUBDIVISION* Subsection in Section 1C of the Technical Specification shall be prepared and coated prior to installation to prevent rust bloom. The Contractor shall prepare all surface areas of the ballast to an SSPC-SP 10 "*Near-White Blast Cleaning*" in accordance with the guidance provided in the *SURFACE PREPARATION* Subsection in this Section of the Technical Specification. To eliminate sharp edges, ***edges shall have a minimum radius of 3mm***. Upon approval of the surface preparation by WSF, the Contractor shall immediately coat all ballast surfaces using INTERNATIONAL Interzinc 52 pre-construction primer, or equal, at 0.75 to 1.0 mils DFT.

14.7.18 Miscellaneous

Areas ***subject to sun glare*** on Pilothouse Control Consoles shall be finished with flat black plastic laminates and wood trim. Other metal surfaces of electrical equipment cabinets, Pilothouse Control Consoles and chart desks shall be prepared and powder coated in accordance with the requirements of the Powder Coating Institute (PCI)

procedures and policies. Colors shall be as set forth in the Technical Specification. Should the Technical Specification be silent as to color, the WSF Representative shall be notified as such and will determine the proper color to be used by the Contractor.

14.8 ZINC ANODES

Zinc anodes shall be provided and installed in all locations where galvanic corrosion of steel structure may occur. These locations shall at least include the following:

A. Engine Room bilge in which seawater pumps are installed. These anodes shall be installed in areas that would typically be submerged if bilge water were present.

B. The seawater side of sea chests.

C. On the exterior shell plate generally in plane with, but just forward of, the propellers, port and starboard.

D. Rudders and rudder flaps.

E. Two (2) half zincs under both propeller rope guards.

F. Adjacent to each keel cooler at eight (8) locations, install 25 lb. Zincs. (For locations where two (2) coolers are installed side-by-side, adjacent to each keel cooler at six (6) locations, install 25 lb. Zincs).

G. Install the Propulsion System Integration (PSI) Contractor's No. 1 & No. 2 End propeller hub zincs, one (1) each hub, with stainless steel bolts. Apply locktite to attaching bolts and torque to suit bolt size.

H. Along the exterior shell plate in way of the stern tubes and struts.

I. Next to the bilge suction in each void, cofferdam.

J. The interiors of the oil-water holding tank, and used oil tanks.

Anodes installed on the exterior hull and within the sea chests shall be zinc cast in steel straps attached to the hull by means of welded studs with Type 316 stainless steel washers and nyloc type nuts. The zinc castings shall be 6 inches × 12 inches by at least 1¼ inches thick.

Zinc anodes within tanks, voids and other interior locations shall comprise at least twenty-two (22) pounds of zinc each, and shall bolt on to steel straps welded to the Vessel's structure. See Section 1 of the Technical Specification.

Notwithstanding the foregoing, the number of zinc anodes of the required sizes to be installed shall be not less than the following at the given locations:

A. Two (2) on the tank top in each quadrant of the bilge region (8 total), and one (1) in each drain well, for each Engine Room and machinery space housing seawater pumps.

B. Two (2) in each sea chest, equally distributed.

C. Twenty (20) (total) on exterior hull in way of the propellers and stern tubes.

D. Six (6) ea. per FERNSTRUM Cooler attached to exterior hull. (**NOTE**: These zincs are ***in addition to*** the attached cooler factory zincs)

E. One (1) per bilge suction in each void, cofferdam.

F. Twelve (12) per rudder assembly

Quantities for the interiors of the oily-water holding tank, and used oil tanks shall be based solely on the formula given above assuming the tanks are full of seawater (e.g., W = area of bottom and side surfaces of tank).

The anode straps and their attachments shall be painted, except where the steel straps are in contact with the zinc material. The zinc material shall not be painted.

14.9 PAINT SCHEDULE

14.9.1 Pre-Construction Primer: Interzinc 52 primer and Interplate NQA993, or equal

A. *General*: The Contractor shall use the above pre-construction primers as directed below. The Contractor is to be cautioned on using INTERNATIONAL top coatings over Interplate 993 primer in tanks that may contain fluids higher than 125F degrees. **WSF assumes no responsibility for any paint failures**.

B. *Areas to be used*: All new steel plate, shapes and steel pipe purchased for steel fabrication (except those components to be galvanized after fabrication) shall be prepared and coated with Interplate NQA993-Gray, or equal.

The use of Interzinc 52 primer shall be limited to touch up applications after fabrication only.

C. *Surface Preparation*: All steel scheduled for coatings must be free from oil, grease, grime and moisture before grit blasting to "*Near White*" SSPC-SP 10. The steel anchor profile after grit blasting shall be 1½ to 2½ mils in depth. All blasted surfaces shall be free of grit blast dust".

D. *Application*: Interplate 993 primer, or equal, at 0.6 to 0.8 mils DFT pre-construction primer shall be applied immediately to all new wheelabrated steel surfaces.

INTERNATIONAL Interzinc 52, or equal, primer at 0.75 to 1.0 mils DFT pre-construction primer shall be applied immediately to all steel surfaces disturbed after fabrication.

E. *Weldability*: The above pre-construction primers may be incompatible with welding procedures and may need to be automatically or manually removed prior to welding. The Contractor must satisfy the welding and inspection requirements of the Authoritative Agencies, and Section 2 of the Technical Specification.

F. *Primer Protection Level/Duration Criteria*: Pre-construction coating surfaces which exhibit rust bloom on their surface shall be considered **not acceptable** in meeting the above pre-construction primer requirements, and shall be re-grit blasted and primed at the Contractor's expense, prior to use. Steel exhibiting rust bloom from the failed surface **shall not** be used on the Vessel during construction.

14.9.2 WSDOT Identification Stripes and Insignia

WSDOT identification stripes and insignia on the exterior curtain plating above the Rub rail and on the funnel exterior shall be painted as typical to the layout of the existing Vessels of WSF. The stripes and insignia shall be applied in addition to, and over the top of, the required completed coating system for those areas. Stripes shall be provided as a two (2) coat system at 1.5 mils DFT each coat as follows:

Stripe, Curtain Plate (approximately 42 inches high) - INTERNATIONAL Intercare 755, "MEDIUM GREEN".

Bottom Stripe, Funnel (approximately 34 inches high to the bottom side of the first louver) - INTERNATIONAL Intercare 755, "MEDIUM GREEN".

Top Stripe, Funnel (top cap of the funnel and down to nine inches below the 45 degree knuckle) - INTERNATIONAL Intercare 755, "BLACK".

Funnel Louvers (interior) - INTERNATIONAL Intercare 755, "BLACK".

Any areas not specifically defined in **TABLE 14-2**, shall be coated as directed under "Elsewhere" in **TABLE 14-2**.

14.9.3 Standard WSF Exterior Color Scheme

The below standardized Color Scheme is that used throughout the WSF Fleet and is presented as "information only". It is a quick colors guide for painting of exterior areas. Should a conflict arise, as to color, between this Subsection and **TABLE 14-2**, the Contractor shall contact the WSF Representative to resolve any conflict for a specific area:

- Pilothouse tops and the top and bottom of visors, and any other structures on the Sun and Navigation Bridge Decks having a canopy top with a curved edge (no coaming), shall be "MEDIUM GREEN / WSF GREEN" (INTERNATIONAL tint No. 89904). The tops of all other structures not having a canopy top with a curved edge (has a coaming), including the crew accommodation block area, the funnel house, and machinery houses are to be "HAZE GRAY" (INTERNATIONAL tint No. K705).

- Interior curtain plates and machinery casings shall have a “HAZE GRAY” dado approximately thirty-nine (39) inches up from the deck, or follow the height of the first longitudinal below curtain plate window cut-outs.
- Vehicle Decks and car ramps in areas that are painted shall be “DARK GRAY”.
- All other exterior decks shall be “HAZE GRAY”.
- All exterior “WHITE” shall be “BLUE WHITE” (INTERNATIONAL tint No. 72942).
- Stanchions, railings, cap-rails, and both sides of all screens shall be painted “MEDIUM GREEN / WSF GREEN” on the Pickleforks, Sun Deck, and the Navigation Bridge Deck.
- Railing on the Vehicle Deck ramps and on the elevator access ramps shall be painted solid “SIGNAL YELLOW”.
- All curbing against the curtain plating shall have the vertical surfaces and the first six (6) inches of the horizontal surface painted “SIGNAL YELLOW”. The remainder of the curbing, extending to the curtain plate, is to be “HAZE GRAY”.
- All curbing against machinery casing and all round bumpers shall be solid “SIGNAL YELLOW”.
- The exterior curtain plate stripe above the guard shall be “MEDIUM GREEN / WSF GREEN”.
- Funnels shall be painted “BLUE WHITE” with a “MEDIUM GREEN / WSF GREEN” stripe at the bottom and a “BLACK” stripe at the top.
- All fire stations, emergency stations, fire ax boxes etc., shall be “ENSIGN RED”.
- Exterior gutters between decks shall be painted “HAZE GRAY”.
- All exhaust funnel tubes shall be “FLAT BLACK” good to 1,300F degrees.
- Generally, the exterior side of doors shall be painted “BLUE WHITE”; the exterior side of all machinery casing doors is to be painted “HAZE GRAY” unless otherwise specified.
- The interior of all shelter decks shall be **“**BLUE WHITE” with a “HAZE GRAY” dado from the deck up six (6) inches, including the Passenger cabin and Sun Deck Passenger Lounge bulkheads.
- All Vessels shall have a six (6) inch “HAZE GRAY” dado up from the deck around the exterior Passenger cabin, Pilothouse, crew accommodation block area, and Sun Deck Passenger Lounge bulkheads.

- Picklefork Decks and Sun Decks shall be coated with "HAZE GRAY" non-skid in traffic areas. No non-skid shall be applied under seating, or within four (4) inches of bulkheads, coamings, or other vertical surfaces.
- MES Station Rooms decks shall be coated with "HAZE GRAY" non-skid. The non-skid shall be applied over the required Structural Fire Protection underlayment and shall be color coated as set forth in the *HIGH SLIDE MARINE EVACUATION SYSTEMS (MES) AND LINK RAFT INSTALLATION* Subsection in Section 16 of the Technical Specification.
- Vehicle Deck non-skid walkways shall be painted with "DARK GRAY" non-skid and striped with a four (4) inch "SIGNAL YELLOW" stripe on each outside edge.
- Vehicle Decks shall have "BLACK" and "SIGNAL YELLOW" striping in way of elevator entrances, entryways to machinery casings, and emergency gear lockers. Vehicle Deck hatches to Steering Gear spaces, emergency escapes, etc., shall be "SIGNAL YELLOW".

14.10 SPARE PARTS AND INSTRUCTION MANUALS

Provide manufacturer's production data sheets and application and installation instructions for all coatings, caulking systems, cement systems and other products specified in this Section, and in accordance with Sections 86 and 100 of the Technical Specification.

14.11 TESTS, TRIALS AND INSPECTIONS

Tests and/or Trials shall be in accordance with this Section and Section 101 of the Technical Specification.

Inspections shall be performed as defined in this Section and in Sections 1 and 2 of the Technical Specification.

14.12 PHASE II TECHNICAL PROPOSAL REQUIREMENTS

The deliverables required by Section 100 of the Technical Specification and the Authoritative Agencies, shall be provided during the Phase II Technical Proposal stage of Work in accordance with the requirements of Section 100 of the Technical Specification.

See Section 100 of the Technical Specification for additional requirements regarding technical documentation.

14.13 PHASE III DETAIL DESIGN AND CONSTRUCTION REQUIREMENTS

The deliverables required by Section 100 of the Technical Specification and the Authoritative Agencies, shall be provided during the Phase III Detail Design stage of Work in accordance with the requirements of Section 100 of the Technical Specification.

The ***Paint Schedule*** required by Section 100 of the Technical Specification shall identify, as a minimum, the following for each space on the Vessel:

1. Name of space (or type of space if several spaces of same type).
2. Surface preparation required (initial and for repair).
3. Coatings to be applied including specific type(s), code number(s), color(s), number of coats, and wet and dry film thickness of each coat.
4. Any relevant remarks.

The ***Vehicle Deck Markings and Color Scheme Diagram*** shall establish marking and color schemes that clearly identify vehicle lanes and highlight curbs, pipe guards, obstructions, and other pertinent features on the Vehicle Decks.

WSF may consider alternate proposals with regard to the application and preparation of pre-construction primers and surface preparation; however, WSF rejection of any proposal shall not be recourse for claims or adjustments in the Contract price. If the Contractor elects to propose alternative procedures and processes relative to the application and preparation of primers and surface preparation, the proposal shall be provided for WSF consideration at least forty-five (45) days in advance of the scheduled date of submission of the ***Paint Schedule***.

See Section 100 of the Technical Specification for additional requirements regarding technical documentation.

(END OF SECTION)